

CLAIMS

1. A bonding method comprising the steps of

placing a second member with a fixed shape on a first member with a flexible and flat configuration with a hot-melt adhesive being sandwiched therebetween,

heating at least said second member up to a temperature equal to or greater than a melting point of said hot-melt adhesive, and

cooling said first member and said second member while pressing said second member so as to contact said first member closely.

2. A bonding method as stated in Claim 1 wherein a heating temperature is 200° C or less and a heating time is 10 seconds or less at said heating step.

3. A bonding method as stated in Claim 1 wherein said first member and said second member are pressed to each other so as to contact each other closely and said second member is heated through a press device in contact therewith at said heating step.

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4. A bonding method as stated in Claim 3 wherein said first member and said second member are pressed to each other so as to contact each other closely and said second member is heated through a press device by suffering ultrasonic vibration at said heating step.

5. A bonding method as stated in Claim 3 or 4 wherein part of a portion of said first member contacting said second member is transmuted or removed at least partially due to heat at said heating step.

6. A bonding method as stated in Claim 3 wherein said heating step is carried out so as to make a portion of said first member contacting said second member after bonding be thinner than said first member before bonding and not to have a through-hole.

7. A bonding method as stated in Claim 3 or 4 wherein heating is performed at an output power of 800 to 2000W for 3 seconds or less at said heating step.

8. A bonding method as stated in Claim 3

or 4 wherein said cooling step is carried out within 2 seconds after completing said heating step.

9. A bonding method as stated in Claim 1 wherein said first member is made of cloth, leather, resin or paper, and said second member is made of glass, stone, pottery, porcelain, metal or resin.

10. A bonding method as stated in Claim 1 wherein a third member with a flat shape and a certain degree of hardness and flexibility is sandwiched between at least one of surfaces of said first member as well as said second member contacting said press device and said press device, and pressed at least at either of said heating step or said cooling step.

11. A bonding method as stated in Claim 10 wherein said third member is Teflon (trademark) glass sheet.

12. A bonding apparatus comprising:  
a heating section for heating at least a second member up to a temperature equal to or greater than a melting point of a hot-melt adhesive, while said second member with a fixed shape is placed on

a first member with a flexible and flat configuration with said hot-melt adhesive being sandwiched therebetween and

a cooling section for cooling said first member and said second member while pressing said second member so as to contact said first member closely.

13. A bonding apparatus as stated in Claim 12 wherein heating temperature is 200 ° C or less and heating time is 10 seconds or less at said heating section.

14. A bonding apparatus as stated in Claim 12 wherein said heating section presses said first member and said second member to each other so as to contact each other closely and heats said second member through a press device in contact therewith.

15. A bonding apparatus as stated in Claim 14 wherein said heating section is a ultrasonic press device which presses said first member and said second member to each other so as to contact each other closely and heats said second member by applying ultrasonic vibration to said second member through a press device in contact therewith.

16. A bonding apparatus as stated in Claim 14 or 15 wherein said heating section heats at an output power of 800 to 2000W for 3 seconds or less.

17. A bonding apparatus as stated in Claim 14 or 15 further comprises a transferring section for transferring said first member and said second member from said heating section to said cooling section within 2 seconds.

18. A bonding apparatus as stated in Claim 12 wherein a third member with a flat shape and a certain degree of hardness and flexibility is sandwiched between said first member as well as said second member and at least one of surfaces of said heating section or said cooling section contacting said first member or said second member, and pressed.

19. A bonding apparatus as stated in Claim 18  
wherein said third member is Teflon (trademark)  
glass sheet.

20. A composition comprising a first member with a flexible and flat configuration, and

a second member with a fixed shape which is bonded with a hot-melt adhesive on said second member  
wherein

a portion of said first member contacting said second member is thinner than other portion of said first member in thickness and does not have a through-hole.

21. A composition as stated in Claim 20 wherein a part of a portion of said first member contacting said second member is transmuted or removed at least partially in the direction of thickness of said first member due to heat.

22. A composition as stated in Claim 20 wherein said first member is made of cloth, leather, resin or paper and said second member is made of glass, stone, pottery, porcelain, metal or resin.

23. A composition comprising a first member with a flexible and flat configuration, and a second member with a fixed shape which is bonded with a hot-melt adhesive on said second member  
wherein

a portion of said first member contacting said second member becomes hardened in a compressed

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